eDNA is an invaluable tool in efforts to preserve Malaysia's endangered species and conserve its rich biodiversity. BERNAMA PIC

HELPING PRESERVATION, CONSERVATION

Better wildlife monitoring with eDNA

NST 08/03/24 M 15 17

BIODIVERSITY monitoring in Malaysia is largely conducted by searching for the species of animals or plants at a certain location using physical identification techniques such as direct observation, camera trapping, capture and release and observing signs of the animal such as footprints and faeces.

Identification can be difficult using these methods and require lots of taxonomic expertise for different groups of species. Some monitoring techniques may also be invasive to the environment, such as marine surveys that rely on highly destructive methods.

Monitoring wildlife using these techniques is often time-consuming when observing a large scale of diverse wildlife. Thus, alternative methods are urgently needed.

Imagine the possibility of identifying the animals present in any environment where we can detect the presence of wildlife without even having to see them by using DNA found in organic matter known as eDNA — environmental DNA.

The implementation of eDNA expands our ability to not only understand individual species but entire ecosystems and coupled with Next-Generation Sequencing (NGS), it is possible to detect thousands of species simultaneously from a single sample.

Through simple analysis, we are able to study the ecosystem that exists at that particular location, from the large visible animals like elephants to even microscopic creatures such as phytoplankton.

Based on the Sixth National Report of Convention on Biological Diversity in 2019, Malaysia has an estimated 306 species of mammals, 567 species of reptiles, 742 species of birds, 242 species of amphibians, and more than 449 species of freshwater fish.

Critically endangered species, such as the Malayan Tiger, Malayan Water Shrews, Black Shrew, Malayan Round-Leaf Bat, Convex Horseshoe Bat, and Sunda Pangolin populations can be assessed in their habitats, providing crucial data for the protection and restoration of their habitats.

Through its capacity to identify the genetic traces of elusive creatures, eDNA emerges as an invaluable tool in the ongoing efforts to preserve Malaysia's endangered species and conserve its rich biodiversity.

This is all possible by analyzing the unique sequence of DNA found in an environmental sample, then matching it to a species having the same sequence of DNA found in a database or DNA libraries.

After that, we can pinpoint where the animals are found and predict their status and population distribution based on where we collected the environmental sample.

MEGAT DANIEL IZMEER M. AL-IMRAN
DR HASMAHZAITI OMAR
Institute of Biological Sciences
Faculty of Science, Universiti Malaya